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NINTH EDITION

*Martha Windholz, Editor
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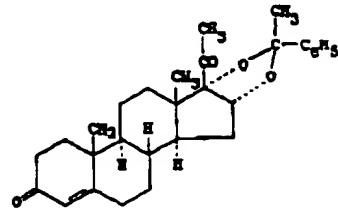
228

Algostane Acetophenide

0.7 in CHCl_3). Prepn: Cooley *et al.* loc. cit.; Fried *et al.* *Chem. & Ind. (London)* 1961, 465. 16 α -Methyl ether, $\text{C}_{27}\text{H}_{30}\text{O}_2$, 17-hydroxy-16 α -methyl- $\text{P}4\text{-eno-3,20-dione}$. Crystals from 95% ethanol, mp 142-143°. $[\alpha]_D^{25} +60^\circ$ ($c = 0.15$ in CHCl_3). uv max: 234 nm ($\epsilon 19,400$). Prepd from the free diol via 16 $\alpha,17$ -dihydroxy- $\text{P}4\text{-eno-3,20-dione}$ cyclic boone: Fried. U.S. pat. 3,006,930 (1961 to Olin Mathieson).

THERAP CAT: Acetonide as a topical anti-inflammatory.

228. Algostane Acetophenide. 16 $\alpha,17$ -Dihydroxy- $\text{P}4\text{-eno-3,20-dione}$ cyclic acetone with acetophenone 16 $\alpha,17$ -dihydroxyprogesterone acetophenide; alphonone acetophenide; P-DHP; Sovitrol; Deladroxone; Drotone. $\text{C}_{27}\text{H}_{28}\text{O}_4$; mol wt 448.51. C 77.64%, H 6.05%, O 14.27%. Prepn: Fried *et al.* *Chem. & Ind. (London)* 1961, 465. Manuf: Fried and Fried. Dlassi. U.S. pat. 3,941,997-8 and 3,006,930 (1960 and 1961, all to Olin Mathieson).



Crystals from 95% ethanol, mp 150-151°. $[\alpha]_D^{25} +51^\circ$ (CHCl_3). Stable to boiling mineral acids; readily cleaved by warming with formic acid, with subsequent deacetylation.

THERAP CAT: Progestin; contraceptive.

229. Algin. Alginate acid sodium salt; sodium alginate; sodium polymannuronate; Keigin; Minus; Protanal. A gelating polysaccharide extracted from giant brown seaweed (giant kelp, *Macrocystis pyrifera* (L.) Ag., *Laminariaceae*) or from horsetail kelp (*Laminaria digitata* (L.) Lamour, *Laminariaceae*) or from sugar kelp (*Laminaria saccharina* (L.) Lamour). Process of manuf: Tecag. *Chem. Met. Eng.* 52, 97 (1945); Mantell. *The Water-Soluble Gums* (New York, 1947); Green. U.S. pat. 2,036,934 (1936 to Kelco); Gioabec. Herter. U.S. pat. 2,128,551 (1938 to Algin Corp. of America). For refs to structural studies see Alginate acid. Review: McNeely, Pettitt, in *Industrial Gums*, R. L. Whistler, Ed. (Academic Press, New York, 2nd ed., 1973) pp 49-81.

Cream-colored powder. Sol in water, forming a viscous, colloidal soln; insol in alcohol and in hydro-alcoholic solns in which the alcohol content is > 30% w/w. Insol in chloroform, ether, in eq acid solns when the pH is below 3.

USE: In the manufacture of ice cream where it serves as a stabilizing colloid, insuring creamy texture and preventing the growth of ice crystals. In drilling muds; in coatings; in the flocculation of solids in water treatment; as sizing agent; thickener; emulsion stabilizer; suspending agent in soft drinks; in dental impression preparations.

THERAP CAT: Pharmacutic aid (suspending agent).

230. Alginate Acid. Norgine; polymannuronate acid. Mol wt about 240,000. A hydrophilic, colloidal polysaccharide obtained from seaweeds which, in the form of mixed salts of calcium, magnesium, and other bases, makes up a large portion of cell walls. Insol from trunks of *Laminaria digitata* (L.) Edmonson, *Laminariaceae*; Stanford. *J. Chem. Soc.* 44, 943 (1883); Bird, Hass, *Bichem. J.* 25, 403 (1931); from *Macrocystis pyrifera* (L.) C. Ag., *Laminariaceae*; Nelson, Cretcher, *J. Am. Chem. Soc.* 51, 1914 (1929). Structure: Hirst *et al.* *J. Chem. Soc.* 1939, 1880; Astbury, *Nature* 155, 667 (1945); Chanda *et al.* *J. Chem. Soc.* 1952, 1833; can be regarded as a family of polymers containing varying proportions of D-mannuronate acid and L-guluronate acid linked through the 1- and 4-positions; Hirst *et al.* *ibid.* 1964, 1493; Hirst, Ross, *ibid.* 1965, 1182. Review: Steiner, McNeely. "Algin in Review" in *Advances in Chemistry Series* No. 11, *Natural Plant Hydrocolloids* (Am. Chem. Soc., Washington, 1954) pp 68-82.

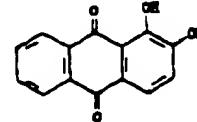
Very slightly sol in water. Tastless. Capable of absorbing 200-300 times its weight of water and salts to the extent

of 60%. Resists hydrolysis. Sol in alkaline solns, pH of a 3 in 100 suspension in water is between 2.0 and 3.4.

Potassium salt. Stereoisomer.

USE: Sizing paper and textiles; as binder for briquettes; mural artificial horn, ivory, celluloid; emulsifying mineral oil; mucilage. Additional uses are described under Algin.

231. Alizarin. 1,2-Dihydroxy-9,10-anthracenedione; 1,2-dihydroxyanthraquinone; C.I. Mordant Red 11; C.I. Pigment Red 83; C.I. 56000. $\text{C}_{14}\text{H}_8\text{O}_4$; mol wt 240.20. C 69.98%, H 3.36%, O 26.64%. Occurs in the roots of the madder plant (*Rubia tinctorum* L., Rubiaceae; Krappwurz) in combination with 2 mols glucose, called rubrueinic acid. Was known and used in ancient Egypt, Persia, and India. Synthesized from 2-anthraquinone monofonic acid, sodium salt by fusion with alkali; Caro *et al.* *Ber.* 3, 359 (1870); Pohl, *Ber.* 9, 261 (1876). Historical review: Fierz. *J. Chem. Ed.* 7, 2609 (1930). Laboratory prep from above ingredients plus potassium chloride: Gattermann-Wieland. *Laboratory Methods of Organic Chemistry* (New York, 1937). Modern methods of manufacture in monograph by Pohl (*Ullmann's Enzyklopädie der technischen Chemie* Vol. I, p 200) and in Fierz-David and Blaiger, *Grundlegende Operationen der Farbenchemie* (Vienna, 3rd ed., 1943). See also *Colour Index* Vol. 2, (2nd ed.) p 3471.



Orthorhombic orange needles by sublimation or from absolute alcohol. Sublates scales from dil alcohol or by evaporation from ether. Sublates at 110° (2 mm Hg), mp 290°. bp 430°. Absorption spectrum: Moir. *J. Chem. Soc.* 1927, 1810. Solubility in water at 18°: 2.1×10^{-4} mols/l; at 25°, 2.5×10^{-4} mols/l. Soluble in 300 parts boiling water; moderately sol in alcohol, freely in hot methanol and in ether at 25°. Also sol in benzene, toluene, xylene, pyridine, carbon disulfide, glacial acetic acid. Sol in water solns of alkalies with blue color, but without fluorescence. Fluorescent solns indicate unchanged 2-anthraquinone sodium sulfonate.

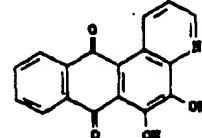
1-Methyl ether, $\text{C}_{15}\text{H}_{10}\text{O}_4$, orange needles with H_2O from dil methanol. When dried at 100° mp 179°.

2-Methyl ether, $\text{C}_{15}\text{H}_{12}\text{O}_4$, orange needles from alcohol, mp 231°.

Dimethyl ether, $\text{C}_{17}\text{H}_{14}\text{O}_4$, golden-yellow needles from alcohol, mp 215°.

USE: In the manufacture of acid and chrome dyes for wool; acid-base indicator (in 0.5% alcoholic soln; pH: yellow 3.5, red 6.8); in spot tests as reagent for aluminum, indium, mercury, zinc, and zirconium; biological stain.

232. Alizarine Blue. 5,6-Dihydroxyanthra[2,3-*f*]quinoline-7,12-dione; 7,8-dihydroxy-5,6-phthalylquinoline; Alizarine Blue R; C.I. 67410. $\text{C}_{14}\text{H}_8\text{N}_2\text{O}_6$; mol wt 291.25. C 70.10%, H 3.12%, N 4.81%, O 21.97%. Prepn from 3-alkoxyalizarin, glycerol, and concd sulfuric acid: Auerbach. *J. Chem. Soc.* 38, 799 (1879).



Lustrous brownish violet needles from benzene, mp 268-270°. Practically insol in water; sparingly sol in alc. ether; slightly sol in cold benzene; sol in amyl alcohol, glacial acetic acid, hot benzene.

USE: As indicator in saturated alcoholic soln. pH: pink 0.0 to yellow 1.6; yellow 6.0 to green 7.6.

233. Alizarine Orange. 1,2-Dihydroxy-3-nitro-9,10-